Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC, 20544

In the Matter of: Enabling Next-Generation Terrestrial Positioning, Navigation, and Timing and 5G: (A Plan for the Lower 900 MHz Band) (902-928 MHz)	Docket No. 24-240, RM-11989

COMMENTS OF NEOLOGY, INC. AND OPPOSITION TO NEXTNAV, INC. PETITION FOR RULEMAKING

INTRODUCTION

NextNav is one of many companies (some very public – some less so) exploring methods to supplement the GPS system. Unlike the others, though, as part of its exploration, NextNav has asked the Commission to restructure entirely the lower 900 MHz band.[1] Were the Commission to do this, it would cause extraordinary damage to an extraordinary number of individuals, companies, and government entities currently using the band for a large variety of critical purposes. And, in so doing, it would inflate the value of NextNav's spectrum holdings by billions of dollars at the expense of both those actively using the band and the broader public. Very rarely has the Commission been asked to do so much for so few, injuring so many, for so little reason. For these reasons, Neology, like so many others, opposes NextNav's April 2024 Petition for Rulemaking.[2]

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[1] *Wireless Telecommunications Bureau and Office of Engineering and Technology Seek Comment on NextNav Petition for Rulemaking*, Public Notice, DA 24-776, WT Docket No. 24-240, RM-11989 (rel. Aug. 6, 2024) ("Public Notice").

[2] NextNav Petition for Rulemaking, Enabling Next-Generation Terrestrial Positioning, Navigation, and Timing and 5G: A Plan for the Lower 900 MHz Band (902-928 MHz) (filed Apr. 16, 2024), and Letter from Robert Lantz, General Counsel, NextNav Inc., to Marlene H. Dortch, Secretary, FCC (filed June 7, 2024) (collectively the "Petition" or "NextNav Petition").

BACKGROUND

Neology, Inc. headquartered in Carlsbad, CA, is a developer of Radio Frequency Identification (RFID) solutions used in Automatic Vehicle Identification ("AVI") technology, providing efficient tolling and vehicle enforcement solutions to clients – including state tolling agencies – in the United States and globally. As almost any highway drive today will demonstrate, AVI technology is becoming ubiquitous, with tolling authorities across the country rapidly switching to All-Electronic Tolling. While electronic tolling is incredibly efficient for drivers and cost effective for agencies, its public benefits go far beyond avoiding the irritation of stopping at toll plazas. Manual collection of tolls creates significant traffic congestion, decreases efficiency, adds safety risks, and increases pollution. By contrast, AVI provides a reliable means of identifying vehicles as they interact with the toll system at highway speeds – and RFIDs operating in the 900 MHz band are a critical component of AVI technology. In the U.S., these devices operate under 47 C.F.R § 90.353 as non-multilateration location monitoring systems (NM-LMS), in the 902-904 MHz and 909.75-921.25 MHz bands.

NextNav now asks the Commission to commence a rulemaking to reconfigure the Lower 900 MHz by creating a 15-megahertz spectrum block with a 5-megahertz uplink in the 902-907 MHz band and 10-megahertz downlink in the 918-928 MHz band.[3] NextNav boldly asks that it be given this spectrum windfall in return for its far less valuable current licenses.

ARGUMENT

I. The Lower 900 MHz Band is Not Underutilized

NextNav seems to understand the extraordinary nature of its request. So, it relies on an extraordinary assertion to justify that request. It claims that the Lower 900 MHz band "is an ideal candidate for swift FCC action as it is currently underutilized due to an outdated band plan and technical and service rules that limit the use of the band for 5G technologies."[4]

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[3] NextNav Petition at iv.

Even recognizing the primary rule that it is always *a band critical to others* that is "underutilized," the truth is otherwise. The Lower 900 MHz Band, as configured, is critical for existing and rapidly expanding toll technology which – among other things – is essential for funding highway construction and maintenance. The 900 MHz band RFID-based AVI technology allows individual vehicles to be reliably identified by toll plaza infrastructure nationwide. Even as it is rapidly expanding, the current scale of this technology is enormous. *There are more than 150 million toll transponders actively operating today* on toll roads in thirty-six states and territories. And, last year, there were more than *5 billion* electronic tolling transactions. Even if tolling administration were the only major use of this band, it could not fairly be characterized as underutilized. But of course, it is not the only major use of the band as automated commercial vehicle clearance, vehicle access, railway car monitoring, and access control at parking lots, airports, municipal facilities and residential communities are all licensed users in this band. In addition, unlicensed devices utilize this band extensively. Indeed, the number of technologies relying on the band is proliferating almost as quickly as the number of devices.

Precisely because the band is so heavily utilized by drivers and tolling authorities, with extremely tight operating characteristics at highway speeds, interference with RFID transmissions at toll plazas and on express lanes would broadly and adversely affect the public. AVI toll reading on highways requires transmissions that are fast and accurate and, as discussed below, there is a strong probability of disruption to these transmissions were NextNav's proposal implemented. Open Road Tolling systems – which allow vehicles to pass under mounted overhead equipment on highways at speed – especially rely on these fast, accurate transmissions. These tolling systems have little margin for error. With today's equipment, the window to identify the vehicle's transponder can be as small as 80 milliseconds. Reducing the spectrum available to these devices could make the open road system ineffective and deprive the public of critical benefits derived from the free flow of traffic.

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[4] NextNav Petition at 3.

Even where Open Road Tolling is not yet implemented, potential or occasional disruptions in operations due to tag read interference at toll plazas could be more than just a massive annoyance. It could pose serious safety risks. Most of us, at one time or another, have had the experience of a tolling system missing a payment– leading us to slow down or stop or try again in the ensuing confusion. Self-evidently, this poses dangers to ourselves, and to those driving behind us. Were there to be tag read interference, the best result would be increasing congestion. But even only with added congestion there are safety concerns. For example, additional congestion could impede the response of emergency vehicles using a tolled facility to respond to an urgent incident. At worst, failing tag reads across a facility could cause chaos across the road. And wholly apart from safety risks, interference disabling accurate RFID readings at plazas would impose on the public the costs of congestion and unpredictability of travel time, as well as increased vehicle maintenance costs and lower air quality due to idling.

The costs of interference into RFID tolling systems would also be borne by state agencies and government-private partnerships that operate tolling systems and rely on efficient solutions to meet bond obligations and fund critical infrastructure maintenance. Agencies may be forced to expand expensive manual image review processes to remediate reduced AVI accuracy, invest in different technologies, or hire specialized technical support to resolve acute interference issues that were not previously anticipated. And as states enact new, more complicated toll policies such as congestion pricing, the potential for erroneous readings or incorrect charges ought not be exacerbated by the risk of RF interference. Contrary to NextNav's suggestion that the lower 900 MHz band is sitting fallow, it is currently deployed in a critical public facing infrastructure that could not readily or rapidly adapt to this change.

II. The NextNav Proposal Threatens to Disrupt Tolling Infrastructure

NextNav suggests that its proposal would not cause harmful interference to current users of the Lower 900 MHz band. One major warning sign about this proposal is how little technical detail NextNav offers to support that assertion. And the detail that is offered strongly suggests that the contrary is true.

The requested 5 and 10 MHz sub-bands (902-907 MHz and 918-928 MHz) are directly adjacent to the proposed relocation of NM-LMS service into the 907-918 MHz band. The Petition does not include any guard band between these services and would adopt rules similar to Part 27, which allows base stations with more than two to three orders of magnitude increase of RF transmit power on the band edge. Adoption of the rules proposed by NextNav would introduce a new and significantly more powerful interference source in close proximity to the NM-LMS service. This potential new high power interference source is likely to impact existing NM-LMS readers by producing signal levels that exceed the reader's filtering capability for M-LMS stations. Moreover, the significantly increased base station signal is likely to block the receiver on a transponder.[5]

While unable to determine the exact risks of interference without more complete technical data, Neology can already anticipate interference risks between transponders and handheld mobile devices. The 150 million transponders (or "tags") on the road are critical for accurate toll transmission reading. Under NextNav's proposed uplink band in 902–907 MHz, uplink operations may transmit at up to three watts ERP in this band with mobile radio.[6] Smartphone devices emitting approximately 200 mW will be within mere feet of the transponders affixed to a vehicle's windshield. Where tolls must be processed quickly and accurately, without further data on how these devices would function, one can only conclude that this proposal risks the efficiency of the entire toll infrastructure for NextNav's benefit.

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[5] Public Notice at 4, NextNav Petition at A-11.

As a matter of principal, and basic economics, current users of the Lower 900 MHz band, who have abided by the rules and made substantial investment in their operations relying on the protections afforded by licenses, or the applicable rules, should not be made sitting ducks for a new band entrant's interference as it plays hide and seek with the technical details of its proposal.

III. **The NextNav Petition Should be Denied**

NextNav's Petition should be denied. It is based on the erroneous premise that the spectrum it wishes to be given is underutilized. And it attempts to justify being granted a multi-billion-dollar spectrum windfall – without regard to the consequences for other users of the band – on the importance of improving GPS. The NextNav proposal should not be treated as a necessary solution to a matter of public policy given that the USDOT Volpe Center is already evaluating at least 8 alternative solutions, but as a proposal engineered instead to maximize the value of NextNav's assets. This proposal grants them exclusive nationwide spectrum rights in the Lower 900 MHz band, but NextNav offers no commitments that this spectrum would not merely be leased at a premium, and with no data for commenters to evaluate, we cannot be sure that they are anywhere close to developing the technology at a sufficient scale such that affording them this nationwide spectrum would be appropriate. Almost to add insult to injury, NextNav would have free reign to hold this spectrum, while incumbent electronic tolling users in the band would be affected by reduced bandwidth and alternate frequency bounds. With the possibility of leasing spectrum in the 650, 700, or 850 MHZ cellular bands, there are other options currently available to NextNav besides a wholesale restructuring of the Lower 900 MHz band. Improving GPS is, of course, a worthwhile endeavor. But it is one that is being investigated by a variety of government agencies and companies. The suggestion that, while this multi-party investigation is ongoing, the Commission should begin reworking the 900 MHz band – with all the disruption that would cause – is frivolous. It bespeaks a "ready, fire, aim" approach to spectrum policy. Needless to say, it is an approach best rejected.

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[6] *See* NextNav Petition at A-10 (Proposed § 90.1408(c)).

Respectfully Submitted,

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